ISSN (print) 0093-4666 © 2015. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

http://dx.doi.org/10.5248/130.247

Volume 130, pp. 247–251 *January–March 2015*

The lichen genus *Leiorreuma* in China

Xiao-Hua Wang[1, 2], Li-Li Xu[1], & Ze-Feng Jia[1*]

[1] *College of Life Sciences, Liaocheng University, Liaocheng 252059, China*
[2] *College of Life Sciences, Shandong Agricultural University, Taian 271018, China*
*Correspondence to: *zfjia2008@163.com*

Abstract — Four species of *Leiorreuma* (*Graphidaceae, Ostropales*) are reported from China. *Leiorreuma crassimarginatum* is new to science, and *L. dilatatum* and *L. melanostalazans* are new to China. Descriptions accompany a key distinguishing the four *Leiorreuma* species in China. All materials are conserved in HMAS-L.

Keywords — *Ascomycota*, lichenized fungi, *Ostropomycetidae*, taxonomy,

Introduction

According to the revised generic concept (Staiger 2002), *Leiorreuma* Eschw. belongs to the family *Graphidaceae* (*Ostropales*, *Ostropomycetidae*, *Ascomycota*). The lichen genus is characterized by apothecia with conspicuous sessile opened lirellae, a carbonised proper exciple that is often laterally thin but basally well-developed, an inspersed hymenium, and pale brown transversely septate or muriform ascospores that are I–. Only one species, *L. sericeum*, has previously been reported from China. We report here on three additional species for the country, one of which we describe as new to science.

Materials & methods

The specimens examined are deposited in the Herbarium Mycologicum Academiae Sinicae – Lichenes, Beijing, China (HMAS-L). A dissecting microscope (Tech XTS-30D with Canon 600D camera) and a light microscope (Olympus SZ-51) were used for the morphological and anatomical studies. Measurements and illustrations were taken from the manual cross-sections of fruit bodies in tap water. The lichen substances were detected and identified by thin-layer chromatography (TLC) (Culberson & Kristensson 1970, Culberson 1972, Orange et al. 2001).

Taxonomy

Leiorreuma crassimarginatum Z.F. Jia, **sp. nov.** PL. 1

FUNGAL NAME FN570068

Differs from *Leiorreuma hypomelaenum* by its production of norstictic acid and its larger ascospores.

TYPE: China. Guizhou Province, Tongren City, Mt. Fanjing, Daling, 27°55′N 108°41′E, alt. 1570 m, on bark, 5/X/2004, coll. Jiang-Chun Wei & Tao Zhang G425 (**Holotype**, HMAS-L 071776).

ETYMOLOGY: Latin *crassus* and *marginatus*, in reference to the thick thalline margin.

THALLUS corticolous, crustose, grey to pale white, rough, thin, tightly attached to the substratum, without isidia and soralia. APOTHECIA lirelliform, short to elongate, open, simple or sometimes branched, 1–3 mm long, 0.3–0.6 mm wide, sessile, with thick lateral thalline margin, often rounded at the ends, not striate, scattered over the thallus; DISC opened, pale brown; PROPER EXCIPLE laterally slightly and basally thickly carbonized, basal exciple 90–130 µm high; EPITHECIUM brownish, 2–5 µm high; HYMENIUM brownish, inspersed, 85–130 µm high, I–; HYPOTHECIUM brown, 15–40 µm high; PARAPHYSES simple, 1–1.5 µm wide, apices unbranched; ASCI cylindrical to clavate, 6-spored, 80–120 × 15–25 µm; ASCOSPORES brown to brownish, thick-walled, ellipsoid, transversely septate, often 7–12-locular, 35–45 × 10–15 µm.

CHEMISTRY: C–, K+ yellow to brown, P+ yellow; norstictic and stictic acids detected by TLC.

DISTRIBUTION & ECOLOGY: Known only from the type locality, Mt. Fanjing, an important nature reserve in Guizhou Province, South China. Other lichens growing in the surrounding area are species of *Graphis*, *Diorygma*, and *Ocellularia*.

COMMENTS: *Leiorreuma crassimarginatum* is characterized by its sessile lirellae with thick lateral thalline margins, opened discs, entire labia, thickened carbonized basal exciples, the small, brown and thick-walled ascospores, and the presence of norstictic and stictic acids. The new lichen is similar to *L. hypomelaenum*, which differs in its smaller (22–38 × 7–11 µm), 7–12-locular, and thin-walled ascospores and its lack of norstictic acid (Staiger 2002).

Leiorreuma dilatatum (Vain.) Staiger, Biblioth. Lichenol. 85: 296 (2002).

THALLUS corticolous, crustose, pale white to grey, rough to smooth, thickish. APOTHECIA lirelliform, short to elongate, open, simple or branched, 0.5–3 mm long, 0.3–0.7 mm wide, sessile, with thin thalline margin; DISC opened, black to brown; PROPER EXCIPLE laterally slightly and basally thickly carbonized, basal exciple 30–45 µm high; EPITHECIUM brownish, 2–5 µm high; HYMENIUM brownish, inspersed, 80–100 µm high, I–; HYPOTHECIUM brown, 10–20 µm

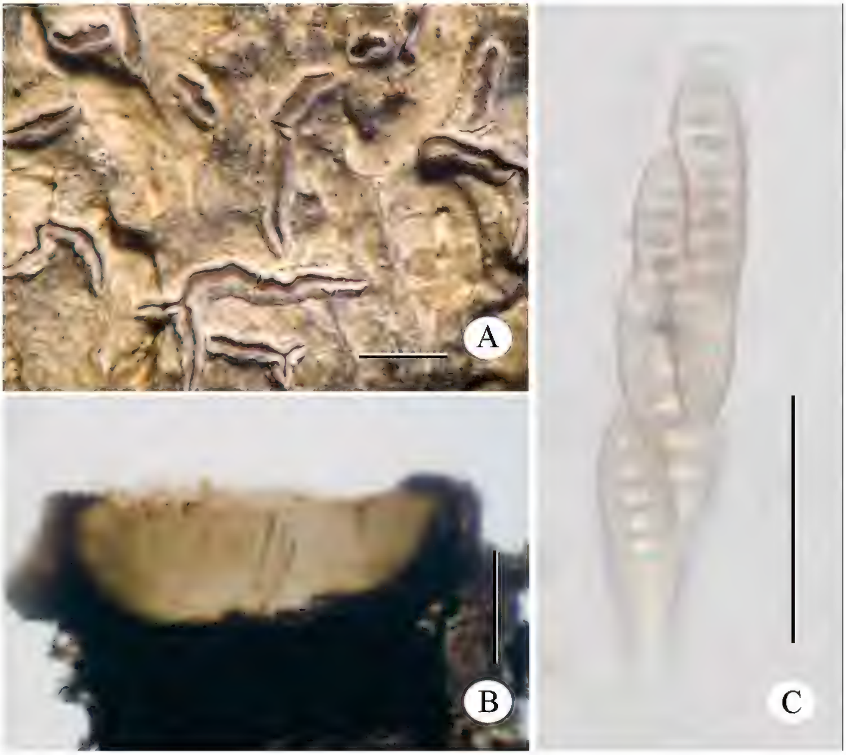

Plate.1. *Leiorreuma crassimarginatum* (holotype, HMAS-L 071776) A. Thallus with lirellae. B. Apothecium, cross-section. C. Ascus containing 6 ascospores. Scales: A = 1 mm; B = 100 μm; C = 50 μm.

high; paraphyses simple, 1–1.5 μm wide, apices unbranched; asci cylindrical to clavate, 8-spored; ascospores brown to brownish, ellipsoid, transversely septate, often 4-locular, 20–30 × 6–8 μm, I+ brown.

Chemistry: C–, K–, P–; no lichen substances detected by TLC.

Distribution & ecology: Collected on Mt. Jianfengling, the largest remaining tropical rainforest on Hainan Island, South China. Associated lichens included species of *Graphis*, *Hemithecium*, and *Lecanora*.

Specimen examined: **CHINA. Hainan Province**, Mt. Jianfengling, alt. 180 m, on bark, 1/X/2008. Jing Li HN081374 (HMAS-L 127475).

Comments: *Leiorreuma dilatatum* is characterized by sessile lirellae with thin lateral thalline margins, opened discs, a basally carbonized exciple, small brown ascospores, and the absence of lichen substances. It is similar to

L. sericeum, which differs by its well-developed thalline and proper margins and its smaller ascospores (14–20 × 5–8 µm, Staiger 2002; 16–18 × 5.5–7.5 µm, our specimens). This is the first report of *L. dilatatum* from China.

Leiorreuma melanostalazans (Leight.) A.W. Archer, Telopea 11: 75 (2005).

Thallus corticolous, crustose, pale grey, rough to smooth, thin. Apothecia lirelliform, short to elongate, open, simple or branched, 1–4 mm long, 0.3–0.5 mm wide, sessile, with thin thalline margin; disc opened, brown; proper exciple inconspicuous, laterally slightly and basally thickly carbonized, basal exciple10–30 µm high; epithecium brownish, 2–5 µm high; hymenium brownish, inspersed, 90–110 µm high, I–; hypothecium brown, 10–15 µm high; paraphyses simple, 1–1.5 µm wide, apices unbranched; asci cylindrical to clavate, 8-spored; ascospores brown to brownish, ellipsoid, transversely septate, often 7–9-locular, 25–40 × 8–10 µm, I+ brown.

Chemistry: C–, K+ yellow, P+ yellow; stictic acid detected by TLC.

Distribution & ecology: Known from two localities in the tropical rainforest in Hainan Island, South China. Associated lichens included species of *Graphis*, *Hemithecium*, and *Phaeographis*.

Specimens examined: CHINA. Hainan Province, Mt. Jianfengling, alt. 630–700 m, on bark, 1/X/2008, Jing Li HN081422 (HMAS-L 117057); 30/IX/2008, Ze-Feng Jia HN080683 (HMAS-L 117056).

Comments: *Leiorreuma melanostalazans* is characterized by sessile lirellae with thin lateral thalline margins, opened discs, a basally carbonized exciple, small brown 7–9 locular ascospores, and the presence of stictic acid. It is similar to *L. exaltatum*, which differs by its lack of lichen substances (Staiger 2002). This is the first report of *L. melanostalazans* from China.

Leiorreuma sericeum (Eschw.) Staiger, Biblioth. Lichenol. 85: 305 (2002).

Thallus corticolous, crustose, pale yellow to grey, smooth, thin. Apothecia lirelliform, short to elongate, open, simple or branched, 0.5–3.5 mm long, 0.2–0.3 mm wide, sessile, with thin thalline margins, disc opened, brown with white-grey pruina; proper exciple laterally thinly and basally thickly carbonized, basal exciple 20–40 µm high; epithecium brownish, 2–5 µm high; hymenium brownish, inspersed, 70–90 µm high, I–; hypothecium brown, 10–15 µm high; paraphyses simple, 1–1.5 µm wide, apices unbranched; asci cylindrical to clavate, 8-spored; ascospores brown to brownish, ellipsoid, transversely septate, often 4-locular, 16–18 × 5.5–7.5 µm, I+ purple-brown.

Chemistry: C–, K–, P–; no lichen substances detected by TLC.

Distribution & ecology: Distributed throughout tropical and subtropical South China. Associated lichens included species in the *Graphidaceae* and *Parmeliaceae*.

SPECIMENS EXAMINED: CHINA. HAINAN PROVINCE, Mt. Jianfengling, alt. 980 m, 28/VII/2009, Jing Li HN247-1 (HMAS-L 117025). GUANGXI PROVINCE, Shangsi County, alt. 600 m, on bark, 31/XII/1997, Shou-Yu Guo 1638 (HMAS-L).

COMMENTS: *Leiorreuma sericeum* is characterized by sessile lirellae with thin lateral thalline margins, opened discs, a laterally and basally carbonized exciple, small (≤18 µm long) brown 4-locular ascospores, and the absence of lichen substances. It is similar to *L. dilatatum*, which differs by its larger ascospores and poorly developed thalline and proper margins (Staiger 2002). *Leiorreuma sericeum* has previously been reported (as *Phaeographis sericea*) from Hong Kong (Thrower 1988, Wei 1991).

Key to species of *Leiorreuma* known from China

1 Ascospores 4-locular; lichen substances absent 2
1 Ascospores >6-locular; lichen substances present 3

2 Thalline and proper margins poorly developed;
ascospores 20–30 × 6–8 µm .... ***L. dilatatum***
2 Thalline and proper margins well developed;
ascospores 16–18 × 5.5–7.5 µm .... ***L. sericeum***

3 Norstictic and stictic acids present; ascus 6-spored;
ascospores 7–12-locular, 35–45 × 10–15 µm .... ***L. crassimarginatum***
3 Stictic acid present; ascus 8-spored;
ascospores 7–9-locular, 25–40 × 8–10 µm .... ***L. melanostalazans***

Acknowledgments

This research was supported by the National Natural Science Foundation of China for the funds (No. 31270066 & 31093440) and Excellent Youthful Scientist Foundation Project of Shandong Province (No. BS2011SW028). The authors are grateful to Dr. Santosh Joshi (CSIR-National Botanical Research Institute, Lucknow, India) and Hua-Jie Liu (College of Life Sciences, Hebei University, China) for their valuable comments on the manuscript and for acting as presubmission reviewers.

Literature cited

Culberson CF. 1972. Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatographic method. Journal of Chromatography 72: 113–125. http://dx.doi.org/10.1016/0021-9673(72)80013-X

Culberson CF, Kristensson H. 1970. A standardized method for the identification of lichen products. Journal of Chromatography 46: 85–93. http://dx.doi.org/10.1016/S0021-9673(00)83967-9

Orange A, James PW, White FJ. 2001. Microchemical methods for the identification of lichens. British Lichen Society, London, UK.

Staiger B. 2002. Die Flechtenfamilie *Graphidaceae.* Studien in Richtung einer natürlicheren Gliederung. Bibliotheca Lichenologica 85. 526 p.

Thrower SL. 1988. Hong Kong lichens. Urban Council, Hong Kong. 193 p.

Wei JC. 1991. An enumeration of lichens in China. International Academic Publishers, Beijing. 278 p.